

SYSTEM OF GEARS FAR FROM MODERN

Auto Transmission Is Called "Barbarous Engineering."

EFFICIENCY IS NOT HIGHEST

Motor Car Engineers After War Expect to Evolve Method of Mechanical Simplicity.

There has been considerable argument from time to time as to which mechanical unit in the modern motor car chassis is the most backward, the most lacking in consistent development. There are but different opinions on the subject, but no commentator could deny the transmission a foremost place in the company of undeviated.

The engineers themselves acknowledge that the transmission of today, while it serves its purpose fairly well, is at least a stop-gap, filling a vital need until we can get something better. One of the most distinguished automobile engineers in America once called the conventional transmission "barbarous engineering."

The present type of gearset lacks the simplicity of operation that should characterize really effective mechanical units. That is to say, they perform the object for which they were installed, but they accomplish it with a tremendous expenditure of effort in proportion to their accomplishment.

The function of the transmission or gearset is to change the tractive effort at the rear wheels in proportion to the needs of operation. It is by means of the transmission that the rear wheels are induced to run slowly while the engine is running fast, etc. This control of the tractive effort is accomplished through the meshing of different sets of gears, which are contained in an appropriate cover or housing.

In operation the power is generated in the engine, passes back through the clutch, which delivers it to a shaft, which is part of the transmission unit. This shaft carries a certain number of gears, which may be shifted into or out of mesh with other gears mounted on what is known as a countershaft. These gears have varying numbers of teeth, which condition produces the changes in tractive effort which it is the gearset's business in life to supply.

This is an outline description of the modern sliding selective transmission, which was first introduced by Parson and Lavasser in the early days of the automobile era and which, in spite of its obvious shortcomings, has never been replaced in the type in general use today. Of course, the gearset of the present is far refined over the crude creations of the early days, but its fundamental crudity is still there.

While the sliding selective gearset, as described, is the predominant type in the field, there are other forms of transmissions in use. There is the planetary gearset, which is used in the Ford car, and consequently on the score of mere numbers is an important member in the situation. The friction gearset once popular is not used today, and the magnetic transmission is used on but few high-priced vehicles because of its costliness.

Simplest One Out of Use.
In the truck field we find the conventional mesh selective gearset in considerable use, but this type has not made any headway in the passenger car field. If we add to this the direct connected transmission as used on the steamer we have completed the list. The reader will note that of the types mentioned only the conventional sliding selective and the planetary as used in the Ford are employed in modern automobile design.

It is rather remarkable that the one type of transmission that may lay claim to really satisfactory simplicity of operation, the friction set, has passed out of use altogether. The friction set consists of two discs at right angles to each other. One of these is driven by the engine and is usually of copper, while the other is of some sort of fibrous composition and is mounted on a shaft extending across the frame and connected with the driving wheels by means of chains.

In operation this driven disc is brought into contact with the driving disc, and the rate of speed is determined by its distance from the center of the latter. The failure of the friction transmission was due primarily to inability to stand up to heavy work. It was early discarded for heavy duty and has now passed on even for light car construction. The friction set has the great advantage of being cheap to make, and, from the driver's point of view, it has the virtue of giving a theoretically limitless number of speeds.

Like Solar System.
The planetary gearset is also a cheap form of construction and consists of a group of spur gears always in mesh, with a master sun gear. This forms a rough likeness to the solar system with the sun in the center and the planets revolving around it, hence the name. In action the shafts are forced to revolve on each other. This is accomplished by stopping the movement of the parts supporting the gears, which is done by means of a sort of brake.

When the gearset is in high it revolves as a unit, which gives a remarkably efficient action. While it is possible to construct a planetary gearset for any number of speeds, in practical application the number of gears that are used. To increase the number means increased complication and destroys one of the great values of the type, simplicity and cheapness to build. The very crudity of the conventional sliding selective gearset, with its parallel shafts and gears slipping into and out of mesh while the shafts are revolving at high speed, ought to suggest to the car owner certain obvious facts. These facts are the need for reasonable handling in operation and careful maintenance of such a much-abused piece of mechanism.

If the gearset is to run without growling and clashing of gears, the shafts must be perfectly parallel so that the gears will mesh accurately. When the shafts get out of alignment, whether it is because of wear in the bearings or springing of the shafts themselves, there will be clashing of the gears until the condition is remedied or until the teeth have chipped, the gears have broken or something else has happened to make repairs imperative. It frequently happens that the rear crankshaft bearing may not be an accurate fit, and this throws out one of the transmission gears and causes a binding.

When once this misalignment occurs in the transmission there is no help short of replacement of the part or establishment of proper alignment if the parts are uninjured. It often happens that a car owner may replace gears that have become noisy only to find the new set just as bad. This is because the shafts are out of line and no gears will perform properly until the condition has been corrected.

The one thing that enables the gear-

set to perform its onerous duties and stay on the job is plentiful and correct lubrication. Oil is the proper lubricant for the transmission, not grease, as used to be thought the case. It is well to use a heavy oil in Summer and a thinner oil during the cold weather. At least three times a season, or better still, every 1000 miles of running, the transmission case should be drained, flushed out with kerosene, and then refilled with fresh oil.

In this period when it is difficult to get new cars and replacements of parts are slow and uncertain we cannot be too careful in advising our readers to give the most scrupulous attention to the lubrication of the gearset. Neglect here will bear rapid fruit, while systematic care of the gearset will probably keep it going during the difficult period of the war. As to the future of the transmission, it is hard to say what will happen. Bad as present types are, there is nothing in sight to take their place. The magnetic gearset has great advantages, but they are gained at the expense of added complications, greater weight and very much greater cost in construction. The beautifully simple friction set gives no promise of coming back in a more satisfactory form.

FORD PRESIDENT ONLY 24 NEW FACTORY HEAD'S SALARY IS \$75,000 A YEAR.

Detroit Plant Will Turn Out Million Cars in 1919 and Million and Half During 1920.

Edsel Bryant Ford, who was elected president of the Ford Motor Car Company to succeed his father, at a recent meeting of the directors, is only 24 years old. He has become the executive head of a corporation representing an investment of \$190,000,000. His salary is \$75,000. His father's was \$150,000.

Mr. Ford, Sr., steps out of the active direction of the Highland Park plant to devote greater time to his other interests, notably the Fordson tractor plant at Dearborn. He retains, however, his seat on the board of the motor company. Every man on the Ford and tractor plant payroll in every part of the world has been guaranteed a minimum wage of \$1 a day, effective since the first of the year. This means a flat increase of \$1 a day over the minimum fixed by Mr. Ford in 1914, for 28,000 persons. Twenty-three thousand other workers employed by the Ford interests already receive \$6 a day or more.

At the same meeting the directors ordered a dividend of 200 per cent, 100 per cent payable in January and 100 per cent in February. The payment would be \$200,000,000. The capital of the company being \$2,000,000.

Further dividends are expected to be declared within a short time. It is declared within a short time the profits will be turned back to the stockholders in a few months.

Henry Ford, holding the majority of the stock, will realize most heavily on the dividend. The Ford family together has 53 1/2 per cent, Edsel Ford holding a small block of the stock. There are seven stockholders, including the Dodge brothers, who started suit against the company a year ago for a share of the undivided profits of the company, which were being turned into the construction of new plants in Dearborn. The decision in this suit is now up to the Supreme Court.

The big melon is divided approximately as follows: Ford family, \$2,250,000; James Couzens, \$800,000; Dodge brothers, \$400,000; Gray estate, \$400,000; J. W. Anderson, \$200,000; Horace H. Rackham, \$200,000.

The new president of the Ford company started in at the bottom, and he has worked through practically every manner he gained first-hand knowledge of the Ford system of production and operation. Today he is said to be the one man in the Ford establishment who knows more about the factory than his father.

It is officially announced also that the plant is now drafted for a production of 1,000,000 cars during 1919 and 1,500,000 in 1920.

MORE TRACTORS AVAILABLE

VEHICLES PROVE WORTH IN INTENSIVE FARMING.

Manufacturers Now Have Material to Fill Big Demand in United States.

"The announcement made by Hoover that the United States must expect to furnish 60 per cent of the food required to feed the world this year can only mean intensive cultivation in a way that has probably never been known in this country," says T. L. McNeff, of McNeff Bros., distributors here of the Cleveland tractor.

"To accomplish this tremendous task the tractor must be used. Not only has the supply of horses and mules been greatly depleted, but the demands that will be made upon labor will be far greater than the world has ever known, even during war. The ground used to furnish food for horses and mules can be used to raise grain to feed humanity.

Releasing 12,000,000 tons of steel will accelerate production of all kinds, and this change will aid the Cleveland plant in turning out in greater numbers this machine that has been proven in industrial plants all over the world. Although preparations have been made at the factory to care for European trade on a large scale, we have been assured that this country will first be cared for."

Complete Portland \$1685.00

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WAR CAR EQUIPMENT WORTH 353 MILLIONS

Appropriations to June, 1919, Total \$886,000,000.

MORE WILL BE INVESTED

Report of Secretary of War Shows How Extensively Trucks and Autos Were Used.

The annual report of the Secretary of War for the fiscal year ending June 30, 1919, includes in its statement reports on the Motor Transport Corps, tractors and aviation. The Motor Transport Corps personnel, states the report, totals 2700 officers and 77,000 men. This is exclusive of the motors and vehicle division of the Quartermaster's Corps, which is in charge of purchase and procurement. Automotive equipment carried over for the fiscal year 1918 amounted to \$252,000,000.

The appropriations for motor transportation for the fiscal year ending June 30, 1919, totaled \$886,000,000, of which \$250,000,000 has been expended or will be expended on contracts which cannot be canceled. A further expenditure of \$2,000,000 will be necessary for the repair shop and equipment program and additional expenses incident to demobilization and liquidation of the vehicles left on hand are estimated at \$6,000,000. Equipment which will be carried over into the fiscal year 1920 represents an expense of \$73,000,000.

Army Uses \$2,500 Trucks.
To date, states the report, \$2,500 standardized and commercial types of trucks, 16,000 motor cars, 27,000 motorcycles, 22,000 bicycles and a great number of trailers have been completed for the army. There are on hand overseas more than 55,000 motor vehicles. Seventeen thousand five hundred motor vehicles were shipped to American expeditionary forces in October, while there were available for shipment on November 1, 1918, 12,000 additional motor vehicles.

The convoy service of the United States, although formed primarily for training purposes, states the report, has since its organization transported more than 14,000 trucks overseas, a greater part of which carried freight in the shape of spare parts and motor equipment.

The Motor Transport Corps had on hand at the time of the report a balance of \$501,638,824 from appropriations. Truck production for the fiscal year of 1918 totaled \$4,490 trucks and other motor vehicles amounted to 65,452.

17,000 Cadets Graduated.
That section of the report dealing with aviation, after enumerating figures which have already been published relative to production, states that at the cessation of hostilities there were 17,000 cadets graduated from ground flying schools, 6,528 men training as aviators, 8,602 reserve military aviators graduated from the elementary training schools, and 4028 aviators who had completed the advanced training course. In addition, 14,000 mechanics had been graduated from training schools.

On September 30, 1918, there were 22 squadrons composed entirely of American personnel at the front, of which 15 were in pursuit, 13 observation and 4 bombing.

Reports of air casualties show that two aviators lost their lives in accidents for each aviator killed in battle. The report on battle fatalities up to October 4 were 123 and the overseas fatalities at training fields in the United States totaled 282. The air service which in April, 1917, comprised 65 officers and 1,120 men, at the signing of the armistice totaled 190,000, of which there were 20,000 commissioned officers, 600 training cadets, 164,000 enlisted men and 11,000 other flyers. The air service constituted over 5 per cent of the total strength of the army.

TRUCKS ENTER WALLED CITY

Breach Has to Be Made in Jerusalem's Centuries-Old Barrier.

No provision was made for the entrance of motor trucks when the walls were built around the city of Jerusalem centuries ago. The only means then known or used for bringing supplies into the city were on men's backs and by donkeys. Accordingly, when the relief trucks of the American and Syrian relief committee began to bring in supplies of food and clothing it was found necessary to make a breach in the wall near the Jaffa gate.

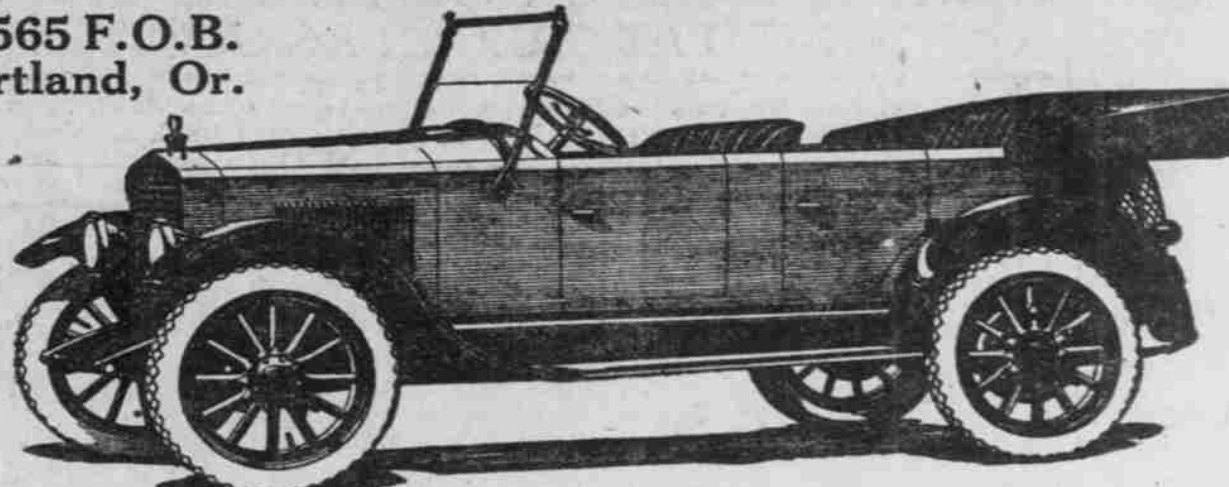
Trucks have been hauling part of the \$15,000,000 worth of food which the American public has contributed for the starving millions in the Near East during the past three years. A cable received Christmas morning from Major Townbridge in Jerusalem states: "Thousands of Armenian deportees

trekking from Hama across the mountains to their devastated homes in Kessab near Antioch. Funds especially necessary to rebuild roofs, equip hospitals and furnish food and employment until harvest."

There are over 4,000,000 homeless, destitute people in the Near East, 400,000 of whom are orphans. Thousands are actually starving to death daily. Their only hope for life is American generosity. A nation-wide campaign

was inaugurated January 12 to secure \$30,000,000 by the American committee for relief in the Near East, formerly the Armenian and Syrian relief committee. All administration expenses of this organization are privately met. Every cent contributed is spent for relief.

\$1565 F.O.B. Portland, Or.



The Essex Made Good

Thousands Praise the New Car

Won't You Ride In It?

This has been a notable week in automobile history. It marks the introduction of the new light weight, moderate priced, high quality car that has been expected for almost two years. The Essex made its first showing in hundreds of cities last Thursday. Thousands have been to see and ride in it.

The great words you have heard spoken for the Essex are the voluntary expressions of its admirers.

The Essex is being advertised by those thousands who now know its qualities. That is why we urge you to come and see and ride in the car that has made such favorable impression.

Praised Because It Is Light, Low Priced, Economical, Elegant and Enduring

People talk of its beauty and the elegance of its appointment. They compare these qualities with those of fine, large and costly cars. Its lightness and economy of operation are noted and are compared with similar advantages that are exclusive to light cheap cars.

The Essex was built to meet the demand for a car that would give comfortable and enduring service, that possessed the qualities that appeal to one's good taste, that would meet every performance requirement and still was neither large, high priced nor expensive to operate.

It is the manner in which it fulfills all these demands that is exciting so much interest just now.

Not a word of praise has been put out by the manufacturer.

All dealers were instructed to let the Essex speak for itself.

We wanted to begin advertising the Essex as soon as we had seen it. We knew it would be months before it would be ready for delivery, but we wanted everyone to know what kind of a car they might expect.

But the Essex builders have been manufacturing fine cars for years. Their factory is one of the largest in the industry. They know that no words of praise can equal in their influence the impression that the car itself can make. So they said we should not advertise the Essex until there was an Essex for the people to see and ride in.

Now the People Are Advertising It

That is the only thing about the Essex we want to call your attention to in this newspaper.

If you will come see the car and ride in it we know what you will do. You will join the thousands who are saying things in more convincing words than we can print. Your endorsement will go farther than anything we can say.

The appeal of the Essex is irresistible. Everyone admires it. It is making friends of all who stop to note its appearance or who will ride in it over the rough roads we pick out to reveal its comfort and sturdiness. We don't need to promise marvelous performance qualities. When you ride in the Essex you will know how it accelerates and pulls under load and how it glides over the roughest roads with a smoothness that you have thought possible only in much larger and costlier cars.

You will know how economical it is and can see the provisions that have been made to keep it free from rattles and squeaks.

Are you interested in seeing them?



C. L. Boss Automobile Co.

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Portland

Another Federal Claim

Federal Trucks are below the average in price and above the average in quality

This claim may sound like the impossible, but investigation will prove that it is true. In a recent advertisement dealing with truck prices, we gave comparison prices that proved Federals of different capacities to be lower than the average of other trucks of like sizes. A study of the standard units that make up the entire Federal construction—motor, bearings, axles, transmission, clutch, drive, etc.—complete the proof. No other truck can offer you more in quality or service.

Capacities 1 to 7 Tons

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Oldest Motor Car Organization on the Pacific Coast, With Branches at San Francisco, Los Angeles, Oakland, San Diego and Fresno.

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New MOON Six-36

The smart looks and unquestionable car value of this Moon light Six are such that the car immediately took its place as the leader in its field.

The Moon Six-36 was designed, built and priced to fulfil a definite purpose—to provide the man of moderate means with a high-grade Six that is economical to run.

Read these specifications—part of the Moon Six-36's equipment: 114-inch wheelbase—Continental six-cylinder motor—polished solid walnut instrument board, front and rear—sweeping double cowling—Felder radiator—stylishly extra high-slanting windshield—Spicer joints—Timken bearings.

Let us show you this car—and show you what it can do on the roads.

Complete Portland \$1685.00

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